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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,975	11/16/2006	Vesa Myllymaki	0696-0229PUS1	2874

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BIRCH STEWART KOLASCH & BIRCH  
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EXAMINER
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BLAND, LAYLA D

ART UNIT	PAPER NUMBER
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1623

NOTIFICATION DATE	DELIVERY MODE
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02/12/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/566,975	<b>Applicant(s)</b> MYLLYMAKI ET AL.	
	<b>Examiner</b> LAYLA BLAND	<b>Art Unit</b> 1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 17, 2008 has been entered.

This Office Action is in response to Applicant's request for continued examination (RCE) filed November 17, 2008, and amendment and response to the Final Office Action (mailed June 17, 2008), filed November 17, 2008 wherein claims 11, 12, and 14 are amended.

Claims 1-14 are pending and are examined on the merits herein.

In view of Applicant's amendment submitted November 17, 2008, the rejection of claims 11, 12, and 13 under 35 USC 112, second paragraph, for being indefinite with regard to "reactive derivative" is withdrawn.

The following rejection is modified from the previous office action:

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nobuo et al. (JP 2002-003478, January 9, 2002, machine translation, of record) and Swatloski et al. (WO 03/029329, April 10, 2003, PTO-1449 submitted February 2, 2006) in view of Peltonen (US 5,589,577, December 1996).

Nobuo et al. teach a method of modifying sugars and polysaccharides using an ionic liquid in combination with water sensitive reagents such as acid halides and acid anhydrides [0031]. Ionic liquids solubilize macromolecules and biopolymers [0001] and are known in the art; for example, ionic liquids comprising N-dialkyl imidazolium ion [0003].

Nobuo et al. do not teach the use of microwave irradiation and do not teach modifications of starch in particular.

Swatloski et al. teach the dissolution of cellulose in ionic liquids using a microwave heating [page 19, first full paragraph]. Ionic liquids comprising chloride anions and imidazolium cations were most effective [page 29, last two paragraphs]. Exemplary ionic liquid cations, molten at a temperature of less than about 150°C [pages 10 and 11], include the cations shown in claims 5 and 6 of the instant application. Cellulose can be dissolved for derivatization [page 18, last sentence] and regenerated in a number of forms from the solution by mixing with water, ethanol, or acetone [page 28, first full paragraph].

Swatloski et al. teach derivatization of cellulose, but not derivatization of starch.

Peltonen teaches that "the methods of preparing fatty acid esters of polysaccharides are generally known and constitute knowledge belonging to basic chemistry." [column 2, lines 5-10]. Peltonen's invention is drawn to the use of an improved solvent system [column 2, lines 27-34] for preparing fatty acids of polysaccharides, wherein those polysaccharides include starch and cellulose [column 3, lines 33-43].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the esterification of starch using the ionic liquids taught by Swatloski et al. and water sensitive reagents such as acid halides and acid anhydrides, as taught by Nobuo et al. Derivatization of polysaccharides using acid halides or acid anhydrides in ionic liquids is known in the art, as taught by Nobuo et al. The skilled artisan could have used the guidance provided by Swatloski et al. to optimize specific conditions for esterification of starch because starch and cellulose are both glucose polymers and thus esterification would be expected to proceed similarly on either. Neither Nobuo et al. nor Swatloski et al. teach the use of pressure for solubilization or derivatization of polysaccharides, but the skilled artisan would understand that solubility, an integral part of the teachings of Nobuo et al. and Swatloski et al., increases with pressure. Furthermore, pressure is an experimental parameter easily manipulated by the skilled artisan in chemical syntheses. The Peltonen reference is cited to demonstrate that esterification of polysaccharides is well known and that starch and cellulose are both polysaccharides which can be esterified in a similar manner.

### ***Response to Arguments***

Applicant argues that starch is larger than cellulose, and thus it would not be obvious that starch could be dissolved and derivatized in ionic liquids. As was discussed in the office action mailed June 17, 2008, the skilled artisan would have had a reasonable expectation of success based on the teachings of the cited references, and “Obviousness does not require absolute predictability of success.” *Id.* At 903,7 USPQ2d at 1681. Further, as shown in the Peltonen reference above, cellulose and starch are both polysaccharides and can be subject to the same esterification reaction.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAYLA BLAND whose telephone number is (571)272-9572. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Anna Jiang can be reached on (571) 272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shaojia Anna Jiang/  
Supervisory Patent Examiner, Art Unit 1623

/Layla Bland/  
Examiner, Art Unit 1623